

Experience with a Partial Cover Lagoon

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Goals of partial cover lagoon

- Utilize potential energy
- Improve performance and perception of business
- Install at Minimal cost
- Minimize impact to current production and LNM
- Utilize existing infrastructure



Utilize potential energy

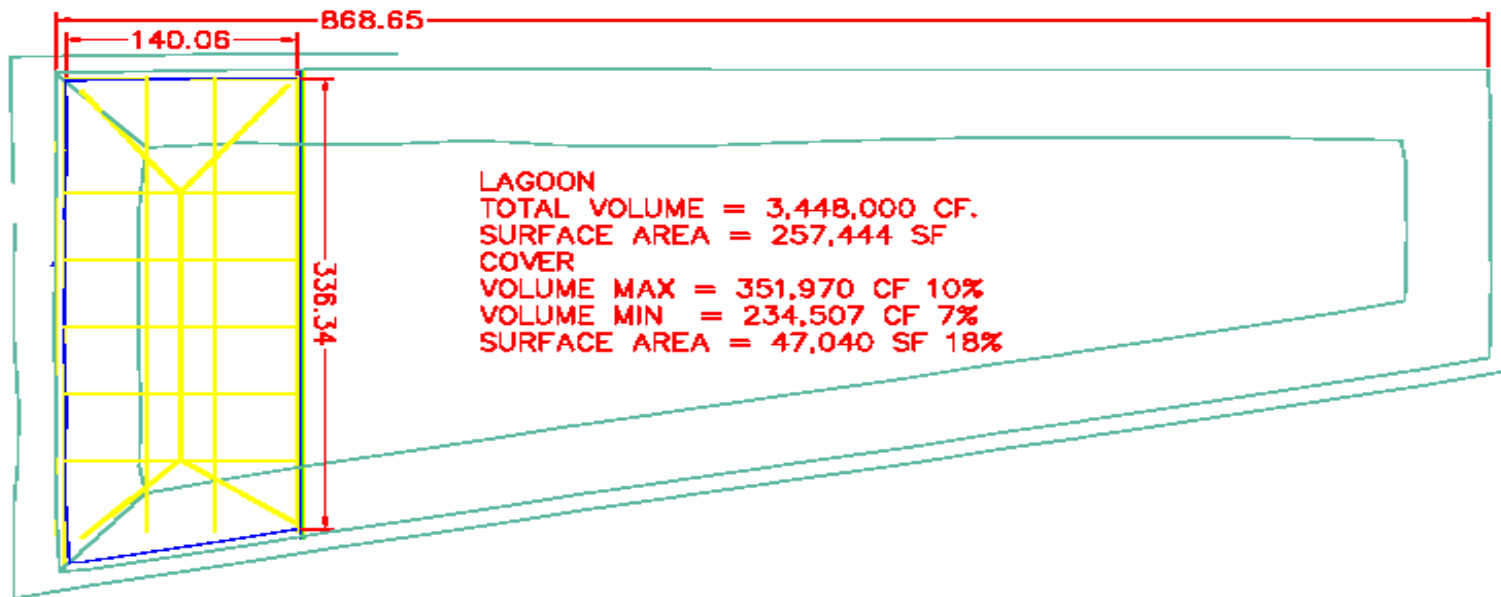


Improve performance and perception of business



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Cover Area – Minimized Cost

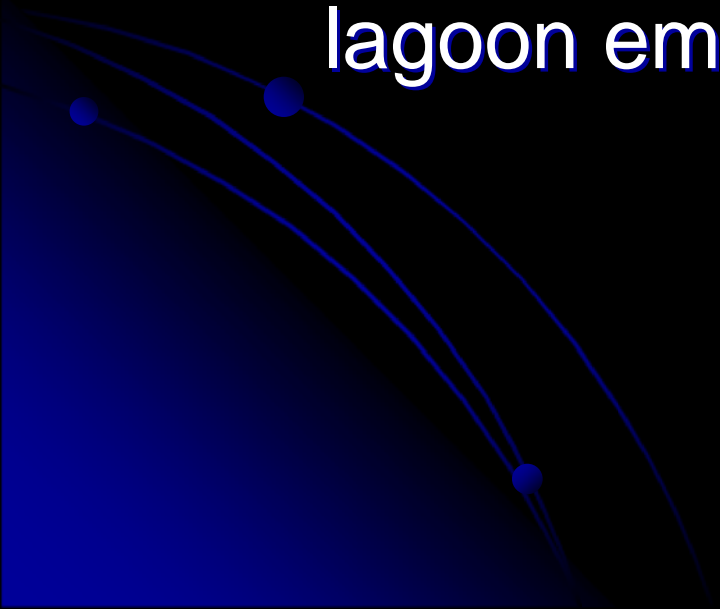


Minimize impact to current
production & LNM and use existing
structures



Beneficial Effects of Cover

- Methane collection
- Rainfall impact reduction
- Reduce Emissions
- Reduce wave actions / erosion on lagoon embankment



Methane collection



Rainfall impact reduction



Detrimental Effects of Cover

- Evaporation loss
- Reduces surface area with air contact and potential to gain D.O., which decreases the possibility of facultative or aerobic bacteria reducing ammonia to N_2



Successes

- Gas collection system
- Simple
- Ballast
- Robust enough – withstood tropical storms
- Remove rainwater
- Reasonable cost
- Minimized impact to LNM
- Minimized impact to production

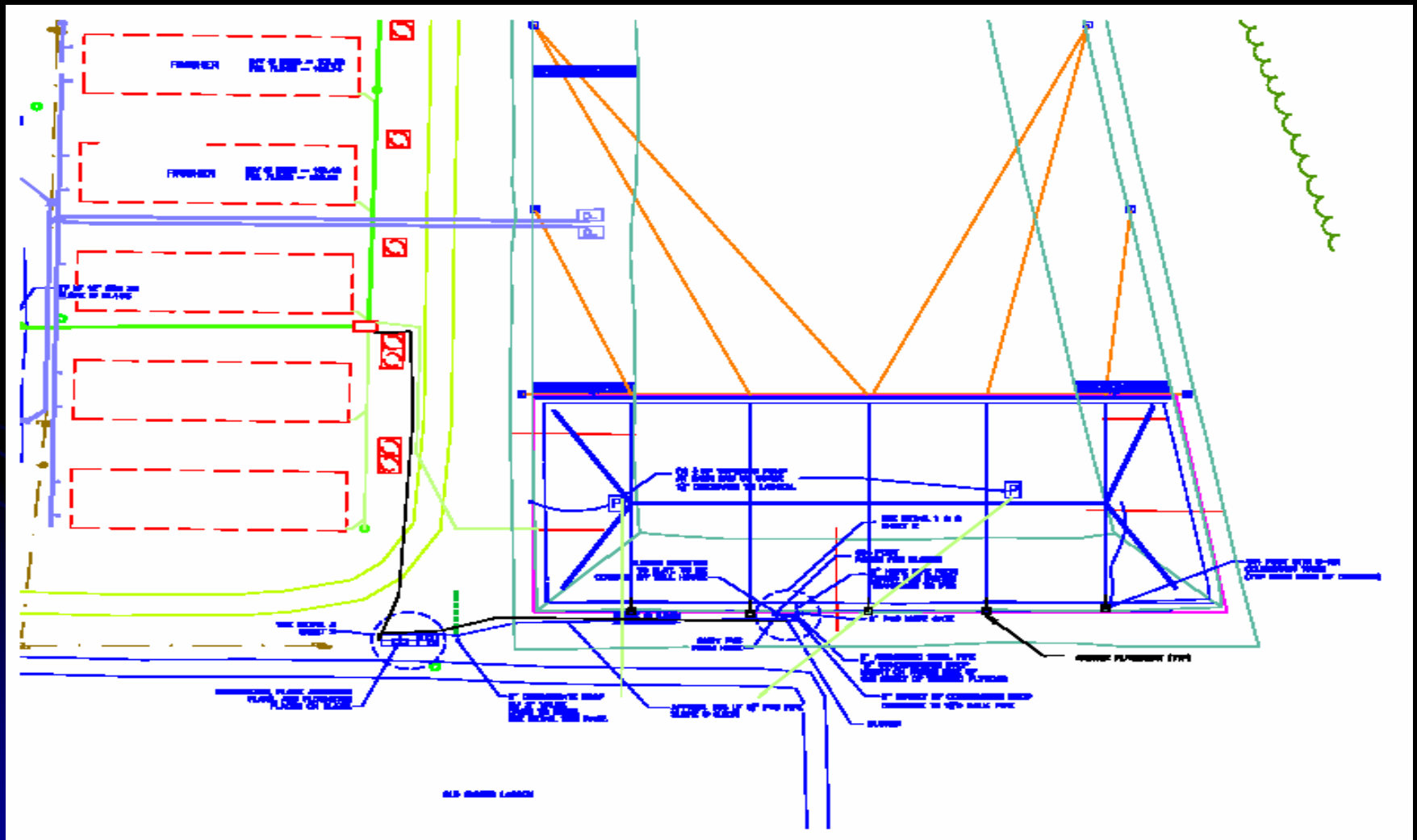
Gas collection system



Robust enough to withstand tropical storms



Robust enough to withstand tropical storms



Not so successful issues

- Feeding – impacts to “normal” farm operation
- Retention time
- Mixing
- Sludge removal
- Controls, Automation, Labor - focus

Other Reasons for Digester challenges

- We have significant fluctuations in our swine operations in:
 - Water use / waste produced
 - Feed stuffs
 - Occasional disinfection and medication
 - Changes in waste production from animals placed vs sold
 - Water quality or constituents from wells on farms



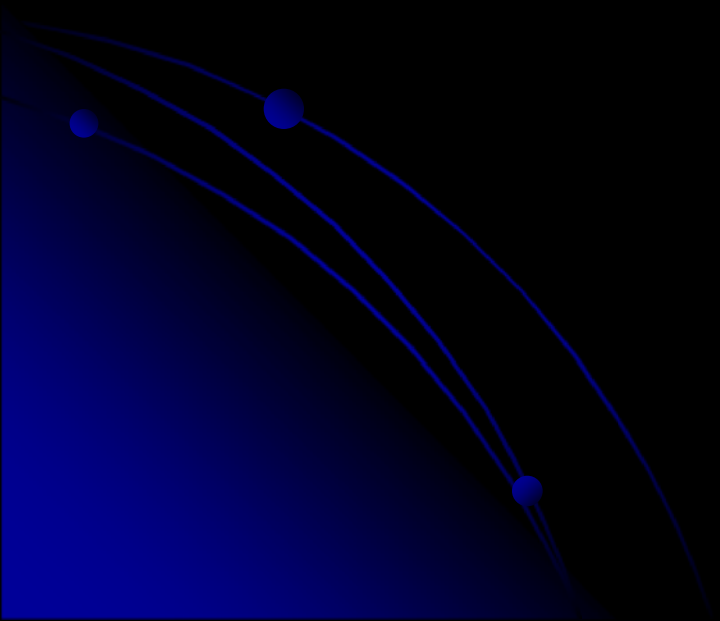
Other Reasons for Digester challenges

- Match methane need / utilization with production variations
 - Incinerator, heat, engine driven mixer or aeration
 - Generator



Other Reasons for Digester challenges

- Hair, gate rods, pig parts, building parts, tools, etc
- Temperature



Key Points - Experience Summary

- Understand the impact to your farm waste removal schedule, nutrient analysis, recycle system, labor needs
- Yield still will not be as high as anyone has told you to expect
- This is not the same thing as Dairy, Municipal, or any other digester- But the same principles apply
- Continued progress is made with each digester installed, however without grants or subsidies MB has not been able to make economically viable.

Key Points - Experience Summary

- Have a backup plan, for deviations in performance, during maintenance, and repair.
- It won't go as well or easily as you expect, but....
- With assistance on the capital cost, increased prices for renewable energy, carbon credits, increased fuel / LP costs, someone is going to be able to make this a profitable deal.